EMCS-TROPI (European Modular Cultivation System -Gravitropism)

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Objective:

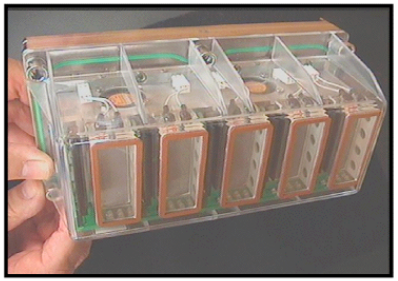
- The purpose of this research is to understand the mechanisms of gravitropism and phototropism in *Arabidopsis thaliana*.

Relevance/Impact:

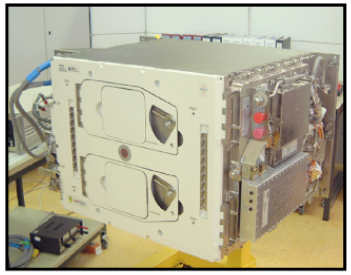
- This research will answer basic questions in plant biology and provide insights into plant cultivation in space to support human exploration.
- The European Modular Cultivation System and TROPI hardware provide a platform to study plant development under fractional-g conditions.

Development Approach & outcome:

- The EMCS facility launched on STS-121 with 8 TROPI experiment containers (ECs). 16 additional TROPI ECs were launched on STS-115 providing the full complement of containers required for total science operations.
- All three experiment runs were successfully completed.
- 40 frozen samples, 8 data tapes were returned on STS-116.
- 70 frozen samples and 4 data tapes were returned on STS-117. 10 samples were left in the MELFI on ISS.
- Early results from analysis of the video tapes show excellent science data return.
- Working with the Cold Stowage Group for descent manifest of the remaining 10 frozen samples from the ISS.

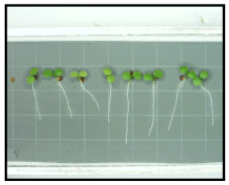


TROPI Experiment Unique Equipment (EUE) showing five seed cassettes.



European Modular Cultivation System (EMCS) plant research facility.

Arabidopsis seedlings inside TROPI seed cassette.



ISS Resource Requirements

Accommodation (carrier)	EMCS on ISS
Upmass (kg) (w/o packing factor)	45.2 kg
Volume (m^3) (w/o packing factor)	0.075 m^3
Power (kw) (peak)	1.494 kW (includes EMCS power)
Crew Time (hrs) (installation/operations)	11.75 hrs
Launch/Increment	ULF1.1, 12A /Increment 13

Project Life Cycle Schedule

Milestones	PDR	CDR	Safety	FRR	Launch	Ops	Return	Final Report
Actual	8/12/02	6/5/03	3/3/05	6/1/06	7/4/06	11-12/06	STS 116/117/TBD	Return + 12m